

P 5



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,571	12/29/2000	Yukimasa Yokoyama	2500.65080	8426

24978 7590 06/25/2003

GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606

EXAMINER

TSAI, CAROL S W

ART UNIT	PAPER NUMBER
----------	--------------

2857

DATE MAILED: 06/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

[Handwritten signature]

Office Action Summary

Application No.

09/751,571

Applicant(s)

YOKOYAMA ET AL.

Examiner

Carol S Tsai

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 and 17 is/are allowed.
- 6) ☒ Claim(s) 2,3,7,8 and 12-15 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 9-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 5,790,334 to Cunningham.

With respect to claims 2 and 7, Cunningham discloses a method of determining a magnitude of a sensing current to be supplied to an electromagnetic transducer (MR transducer heads 108 shown on Fig. 1), comprising: supplying an electric current of a first current value to the electromagnetic transducer and determining a physical quantity appearing in the electromagnetic transducer based on the electric current of the first current value (see Fig. 4; col. 3, lines 19-27; col. 8, lines 21-35 and lines 49-60; col. 9, lines 61-63; and col. 10, line 39-60); supplying an electric current of a second current value, different from the first current value, to the electromagnetic transducer and determining the physical quantity appearing in the electromagnetic transducer based on the electric current of the second current value (see Fig. 4; col. 3, lines 19-27; col. 8, lines 35-39 and lines 49-60; col. 9, lines 63-66; and col. 10, line 39-60); deriving a variation in temperature of the electromagnetic transducer based on the change in

Art Unit: 2857

the physical quantity (see Fig. 4; col. 3, lines 19-38; col. 6, lines 43-54; col. 8, line 21 to col. 9, line 32; and col. 9, line 58 to col. 10, line 38); and determining the magnitude of the sensing current based on a derived variation in temperature of the electromagnetic transducer (see Fig. 4; col. 8, lines 39-48; col. 9, line 66 to col. 10, line 38; and col. 10, line 61 to col. 11, line 24).

As to claims 3 and 8, Cunningham also discloses deriving an expected lifetime of the electromagnetic transducer based on the variation in temperature when determining the magnitude of the sensing current (see Abstract, lines 14-16; col. 3, lines 53-63; col. 6, lines 43-54; and col. 9, lines 46-57).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent No. 6,476,602 B1 to Gray.

Gray discloses a computer-readable storage medium containing program instructions for determining a magnitude of a sensing current to be supplied to an electromagnetic transducer, comprising: computer program code causing a computer to supply an electric current of a first current value to the electromagnetic transducer (see Fig. 6 and col. 4, lines 41-59); computer program code causing a computer to determine a physical quantity appearing in the

Art Unit: 2857

electromagnetic transducer based on the electric current of the first current value (see Fig. 6 and col. 4, line 59 to col. 5, line 30); computer program code causing a computer to supply an electric current of a second current value, different from the first current value, to the electromagnetic transducer (see col. 4, lines 41-59); computer program code causing a computer to determine the physical quantity appearing in the electromagnetic transducer based on the electric current of the second current value (see Fig. 6 and col. 4, line 59 to col. 5, line 30); and computer program code causing a computer to determine the magnitude of the sensing current based on a change of the physical quantity (see col. 5, line 31 to col. 6, line 38).

As to claim 13, Gray also discloses the storage medium (memory 452 shown on Fig. 6) being a memory chip incorporated in a magnetic disk drive.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,476,602 B1 to Gray in view of U. S. Patent No. 5,790,334 to Cunningham.

As noted above, Gray discloses the claimed invention, except for a receiver for calculating a first electric resistance value of the electromagnetic transducer based on a first voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the first current value; calculating a second electric resistance value of the

Art Unit: 2857

electromagnetic transducer based on a second voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the second current value; and calculating a quantity of variation in temperature of the electromagnetic transducer based on the first and second electric resistance values in determining the magnitude of the sensing current.

Cunningham teaches calculating a first electric resistance value of the electromagnetic transducer based on a first voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the first current value; calculating a second electric resistance value of the electromagnetic transducer based on a second voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the second current value; and calculating a quantity of variation in temperature of the electromagnetic transducer based on the first and second electric resistance values in determining the magnitude of the sensing current (see col. 7, line 40 to col. 8, line 20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Gray's method to include calculating a first electric resistance value of the electromagnetic transducer based on a first voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the first current value; calculating a second electric resistance value of the electromagnetic transducer based on a second voltage value appearing in the electromagnetic transducer in response to supply of the electric current of the second current value; and calculating a quantity of variation in temperature of the electromagnetic transducer based on the first and second electric resistance values in determining the magnitude of the sensing current, as taught by Cunningham, in order to determine the voltage/current (VI) characteristics associated with each MR head.

As to claim 15, Gray also discloses the storage medium (memory 452 shown on Fig. 6) being a memory chip incorporated in a magnetic disk drive.

Allowable Subject Matter

8. Claims 4-6 and 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 16 and 17 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

U. S. Patent No. 5,790,334 to Cunningham is the reference closest to the claimed invention. Cunningham discloses a method of determining a magnitude of a sensing current to be supplied to an electromagnetic transducer for reading data, comprising: supplying an electric current of a first current value to the electromagnetic transducer for reading data; determining a physical quantity appearing in the electromagnetic transducer for reading data based on the electric current of the first current value; supplying an electric current of a second current value, different from the first current value, to the electromagnetic transducer for reading data; and determining the magnitude of the sensing current based on change found in the physical quantity. However, Cunningham does not teach supplying an electric current of a predetermined current value to an electromagnetic transducer for writing data, which is paired with the electromagnetic transducer for reading data and determining the physical quantity appearing in the electromagnetic transducer for reading data based on the electric current of the second current value; and including all of the other limitations in the respective independent claims.

Response to Arguments

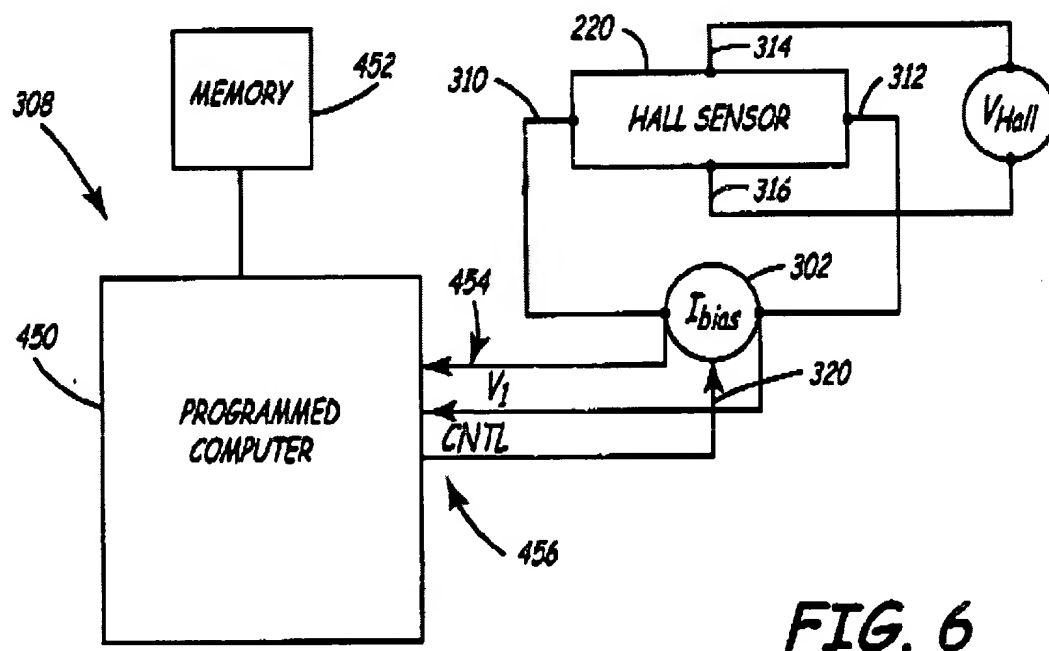
11. Applicant's arguments filed 05/12/2003 have been fully considered but they are not persuasive.

Applicants argue that the cited portions of Cunningham appear only to disclose that a resistance ratio serves as an approximation of the temperature rise of MR read heads, that the invention defined in claims 2 and 7, by contrast, includes, among other features, a process of deriving or calculating a variation in temperature; that this is because, among other reasons, the variation in temperature could take different values depending on the kinds of the material used for MR read heads. The Examiner disagrees with Applicants. As set forth above, Cunningham not only discloses a resistance ratio serving as an approximation of the temperature rise of MR read heads but also discloses the actual calculation or derivation of a variation in temperature transducer (see (see Fig. 4; col. 3, lines 19-38; col. 6, line 43 to col. 7, line 3; col. col. 8, line 21 to col. 9, line 32; and col. 9, line 58 to col. 10, line 38. An optimal MR read head bias current is determined by calculating a resistance ratio, using the change in resistance in the MR read head due to heating in the MR read head at different levels of bias current). In addition, it is noted that the features upon which applicant relies (i.e., the variation in temperature could take different values depending on the kinds of the material used for MR read heads) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicants argue that the Office Action cites Fig. 6 and col. 4, lines 41-59 in Gray as apparently teaching a computer program code causing a computer to supply an electric current

Art Unit: 2857

having different values (first and second current values) to an electromagnetic transducer in order to determine the magnitude of sensing current. The Examiner disagrees with Applicants. As set forth above, the Office Action citing Fig. 6 and col. 4, lines 41-59 in Gray as apparently teaching computer program code causing a computer to supply an electric current of a first current value to the electromagnetic transducer.



Applicants argue that the cited portions fail to disclose or suggest at least some of the features additionally defined in Claims 3 and 8, that this cited portion of Cunningham only discloses that a maximum allowable bias current level is not exceeded in order to preserve the overall life expectancy of each MR head; that the invention in Claims 3 and 8 defines, among other things, a process of deriving an expected lifetime and Cunningham apparently fails to disclose or suggest the actual calculation of an expected lifetime but only suggests a "result" from an appropriate setting of current level. The Examiner disagrees with Applicants. As set Forth Above, Cunningham does disclose the actual calculation of an expected lifetime (see Abstract, lines 14-16; col. 3, lines 53-63; col. 6, lines 43-54; and col. 9, lines 46-57). In addition, it is noted that the features upon which applicant relies (i.e., actually calculation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The Examiner broadly interprets the term "deriving" as "to take, receive, or obtain esp. from a specified source".

Applicants argue that neither Cunningham or Gray appears to disclose or suggest, among other features, at least the additional feature of computer program code causing a computer to calculate a quantity of variation in temperature of an electromagnetic transducer to determine the magnitude of a sensing current, as defined in claims 14, from which 15 also depend. The Examiner disagrees with Applicants. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

Art Unit: 2857

See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Gray discloses the claimed invention, except for the computer program code causing a computer to calculate a quantity of variation in temperature of an electromagnetic transducer to determine the magnitude of a sensing current. Cunningham teaches the computer program code causing a computer to calculate a quantity of variation in temperature of an electromagnetic transducer to determine the magnitude of a sensing current (see (see Fig. 4; col. 3, lines 19-38; col. 6, line 43 to col. 7, line 3; col. col. 8, line 21 to col. 9, line 32; and col. 9, line 58 to col. 10, line 38. An optimal MR read head bias current is determined by calculating a resistance ratio, using the change in resistance in the MR read head due to heating in the MR read head at different levels of bias current). Therefore, the combination of Gray and Cunningham clearly teaches the claimed invention.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2857

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. Tsai whose telephone number is (703) 305-0851. The examiner can normally be reached on Monday-Friday from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703) 308-1677. The fax number for TC 2800 is (703) 308-7382. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (703) 308-1782.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 308-7382. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. Tsai

06/19/03


MARC S. HOFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800